

What is claimed is:

1. An optical service agent for providing bandwidth management services for a user in an optical communication system, the optical service agent comprising:

a user-to-network interface (UNI) for interfacing with an optical communication network;

a peer-to-peer interface for interfacing with peer users; and

optical service logic for interacting with the optical communication

network via the UNI and with the peer users via the peer-to-peer interface for providing said bandwidth management services for the user.

2. The optical service agent of claim 1, wherein the optical communication network comprises an automatically switched optical/transport network (ASON), and wherein the UNI comprises an ASON UNI.

3. The optical service agent of claim 1, wherein the optical service logic comprises:

bandwidth monitoring logic for monitoring bandwidth utilization on a connection.

4. The optical service agent of claim 1, wherein the optical service logic comprises:

bandwidth controlling logic for controlling bandwidth utilization on a connection.

5. The optical service agent of claim 1, wherein the optical service logic comprises:

bandwidth obtaining logic for obtaining additional bandwidth for a connection.

6. The optical service agent of claim 1, wherein the optical service logic comprises:

bandwidth relinquishing logic for relinquishing excess bandwidth for a connection.

7. The optical service agent of claim 1, wherein the optical service logic comprises:

bandwidth allocation logic for allocating bandwidth among multiple connections.

8. The optical service agent of claim 4, wherein the bandwidth controlling logic is operably coupled to prevent bandwidth utilization on the connection from exceeding a predetermined maximum bandwidth utilization.

9. The optical service agent of claim 5, wherein the bandwidth obtaining logic is operably coupled to obtain the additional bandwidth for the connection upon determining that bandwidth utilization on the connection exceeds a predetermined level.

10. The optical service agent of claim 6, wherein the bandwidth relinquishing logic is operably coupled to relinquish excess bandwidth for the connection upon determining that bandwidth utilization on the connection is below a predetermined level.

11. The optical service agent of claim 7, wherein the bandwidth allocation logic is operably coupled to identify an over-utilized connection and an under-utilized connection and to transfer traffic from the over-utilized connection to the under-utilized connection.

12. A device comprising:
a user application requiring communication services from an optical
communication network; and
an optical service agent for providing bandwidth management services
5 for the user application.

13. The device of claim 12, wherein the optical service agent comprises:
a user-to-network interface (UNI) for interfacing with the optical
communication network;
10 a peer-to-peer interface for interfacing with peer users; and
optical service logic for interacting with the optical communication
network via the UNI and with the peer users via the peer-to-peer interface for
providing said bandwidth management services for the user application.

14. The device of claim 13, wherein the optical communication network
comprises an automatically switched optical/transport network (ASON), and
wherein the UNI comprises an ASON UNI.

15. The device of claim 13, wherein the optical service logic comprises:
20 bandwidth monitoring logic for monitoring bandwidth utilization on a
connection.

16. The device of claim 13, wherein the optical service logic comprises:
bandwidth controlling logic for controlling bandwidth utilization on a
25 connection.

17. The device of claim 13, wherein the optical service logic comprises:
bandwidth obtaining logic for obtaining additional bandwidth for a
connection.

18. The device of claim 13, wherein the optical service logic comprises:

bandwidth relinquishing logic for relinquishing excess bandwidth for a connection.

19. The device of claim 13, wherein the optical service logic comprises:

5 bandwidth allocation logic for allocating bandwidth among multiple connections.

20. The device of claim 16, wherein the bandwidth controlling logic is operably coupled to prevent bandwidth utilization on the connection from

10 exceeding a predetermined maximum bandwidth utilization.

21. The device of claim 17, wherein the bandwidth obtaining logic is operably coupled to obtain the additional bandwidth for the connection upon determining that bandwidth utilization on the connection exceeds a

15 predetermined level.

22. The device of claim 18, wherein the bandwidth relinquishing logic is operably coupled to relinquish excess bandwidth for the connection upon determining that bandwidth utilization on the connection is below a

20 predetermined level.

23. The device of claim 19, wherein the bandwidth allocation logic is operably coupled to identify an over-utilized connection and an under-utilized connection and to transfer traffic from the over-utilized connection to

25 the under-utilized connection.

24. A system comprising:
an optical communication network; and
a first network user coupled to the optical communication network,

wherein the first network user comprises an optical service agent for

5 obtaining optical communication services from the optical communication
network via a user-to-network interface (UNI) and for providing bandwidth
management services for the first network user.

25. The system of claim 24, wherein the optical communication network
10 comprises an automatically switched optical/transport network (ASON), and
wherein the UNI comprises an ASON UNI.

26. The system of claim 24, wherein the optical service agent is operably
coupled to monitor bandwidth utilization on a connection.

15 27. The system of claim 24, wherein the optical service agent is operably
coupled to control bandwidth utilization on a connection.

28. The system of claim 24, wherein the optical service agent is operably
20 coupled to obtain additional bandwidth for a connection.

29. The system of claim 24, wherein the optical service agent is operably
coupled to relinquish excess bandwidth for a connection.

30. The system of claim 24, wherein the optical service agent is operably
25 coupled to allocate bandwidth among multiple connections.

31. A method for managing bandwidth for a user in an optical communication system, the method comprising at least one of:

- monitoring bandwidth utilization on a connection;
- controlling bandwidth utilization on a connection;
- 5 obtaining additional bandwidth for a connection;
- relinquishing unused bandwidth for a connection; and
- allocating bandwidth among multiple connections.

32. The method of claim 31, wherein controlling bandwidth utilization on a connection comprises:

- monitoring bandwidth utilization on the connection;
- determining that the bandwidth utilization has exceeded a predetermined level; and
- 15 taking an action to prevent the bandwidth utilization from exceeding a predetermined maximum bandwidth utilization.

33. The method of claim 32, wherein taking an action to prevent the bandwidth utilization from exceeding a predetermined maximum bandwidth utilization comprises dropping packets.

34. The method of claim 31, wherein obtaining additional bandwidth for a connection comprises:

- monitoring bandwidth utilization on the connection;
- determining that the bandwidth utilization has exceeded a predetermined level; and
- 25 obtaining additional bandwidth for the connection.

35. The method of claim 31, wherein relinquishing unused bandwidth for a connection comprises:

- 30 monitoring bandwidth utilization on the connection;
- determining that the bandwidth utilization is below a predetermined level; and

relinquishing excess bandwidth for the connection.

36. The method of claim 31, wherein allocating bandwidth among multiple connections comprises:

- 5 monitoring bandwidth utilization on a number of connections;
 identifying an over-utilized connection and an under-utilized
connection; and
 transferring traffic from the over-utilized connection to the under-
utilized connection.